CLAIMS

1. A coating composition for siliconizing, comprising:

a Fe-Si-based composite compound sintered powder having a grain size of -325 mesh and containing 20 - 70 % silicon by weight; and

a colloidal silica solution containing 15 - 30 part by weight of silica solid matter with respect to 100 part by weight of the sintered powder.

2. The coating composition according to claim 1, wherein the Fe-Si-based composite compound sintered powder has a surface oxide layer formed on a surface thereof and containing oxygen less than 2.0%.

3. The coating composition according to claim 1, further comprising at least one selected from the group consisting of fine SiO_2 powder, alumina powder and alumina sol by 0.2 - 3.5 part by weight with respect to 100 part by weight of the Fe-Si-based composite compound sintered powder.

4. The coating composition according to claim 1, wherein the Fe-Si-based composite compound sintered

powder substantially comprises $FeSi_2$, FeSi, Fe_5Si_3, or Fe_3Si, and comprises the sintered powder of $FeSi_2$+FeSi in excess of 90 wt% with respect to the weight of the Fe-Si-based sintered powder.

5. A method for manufacturing a high silicon electrical steel sheet, comprising the steps of:

coating and drying the coating composition as recited in any of claims 1 to 4 on a surface of a steel sheet containing 2.0 - 3.3 wt% Si; and

diffusion annealing the dried steel sheet in a nitrogen gas atmosphere containing 20% or more hydrogen at a temperature range of 1000 - 1200 °C.

6. The method according to claim 5, wherein the drying step is performed at a temperature of 200 - 700 °C.

7. The method according to claim 5, wherein the diffusion annealing step is performed at a temperature of 1050 - 1200 °C.

8. In a method for manufacturing a high silicon grain-oriented electrical steel sheet, comprising the steps of: reheating and hot-rolling a steel slab to produce a hot rolled steel sheet; annealing a hot rolled sheet and cold

rolling the steel sheet to adjust a thickness of the steel sheet; decarburization annealing the steel sheet; and secondary recrystallization annealing the steel sheet,

the improved method further comprising the step of:

pickling the surface of the grain-oriented electrical steel sheet where the secondary recrystallization is completed to remove a surface oxide layer;

coating and drying the coating composition as recited in any of claims 1 to 4 on the surface of the pickled electrical steel sheet; and

diffusion annealing the dried electrical steel sheet in a nitrogen gas atmosphere containing 20% or more hydrogen at a temperature range of 1000 - 1200 °C.

9. The method according to claim 8, wherein the steel sheet to be coated with the coating composition contains 2.9 - 3.3wt% Si with respect to the weight of the steel sheet.

10. The method according to claim 8, wherein the steel sheet coated with the coating composition is dried at a temperature of 200 - 700 °C.

11. The method according to claim 8, wherein the steel sheet coated with the coating is diffusion annealed

at a temperature of 1050 - 1200 °C.

12. The method according to claim 8, wherein the coating composition is coated on the surface of the steel sheet so as to satisfy the following formulas 1 and 2:

$Y - 5 \leq$ coated amount $\leq Y + 5$ -------- formula 1, and

$Y(g/m^2) = 7650t(x1 - x2)/(A - 14.4)$--- formula 2,

where 't' is a thickness of matrix material, A is a Si content (%) in the Fe-Si-based sintered powder, x1 is a target Si content (%) of matrix material, and x2 is an initial Si content of matrix material.

13. In a method for manufacturing a high silicon non-oriented electrical steel sheet, comprising the steps of: reheating and hot-rolling a steel slab to produce a hot-rolled steel sheet; annealing the hot-rolled steel sheet and cold rolling an annealed steel sheet to adjust a thickness of the steel sheet; recrystallization annealing the cold-rolled steel sheet,

the improved method further comprising the step of:

coating and drying the coating composition as recited in any of claims 1 to 4 on the surface of the cold rolled steel sheet; and

diffusion annealing the dried electrical steel sheet in a nitrogen gas atmosphere containing 20% or more

hydrogen at a temperature range of 1000 - 1200 °C.

14. The method according to claim 13, wherein the steel sheet to be coated with the coating composition contains 2.9 - 3.3 wt% Si.

15. The method according to claim 13, wherein the steel sheet coated with the coating composition is dried at a temperature of 200 - 700 °C.

16. The method according to claim 13, wherein the steel sheet coated with the coating composition is homogenized at a temperature of 1050 - 1200 °C.

17. The method according to claim 13, wherein prior to coating the coating composition, the cold rolled steel sheet is intermediate-annealed such that a total oxygen content in a surface oxide layer of the steel sheet is 210 - 420 ppm.

18. The method according to claim 17, wherein the cold rolled steel sheet is intermediate-annealed at a temperature range of 950 - 1100 °C.

19. The method according to claim 17, wherein the

cold rolled steel sheet is intermediate-annealed in a nitrogen atmosphere containing 50 % or more hydrogen and a moisture atmosphere with a dew point (PH_2O/PH_2): 0.06 - 0.30.

20. The method according to claim 13, wherein the coating composition is coated on the surface of the steel sheet so as to satisfy the following formulas 1 and 2:

$Y - 5 \leq$ coated amount $\leq Y + 5$ -------- formula 1, and

$Y(g/m^2) = 7650t(x1 - x2)/(A - 14.4)$--- formula 2,

where 't' is a thickness of matrix material, A is a Si content (%) in the Fe-Si-based sintered powder, x1 is a target Si content (%) of matrix material, and x2 is an initial Si content of matrix material.